P-10.7 Apply the concepts of heat capacity, specific heat, and heat exchange to solve calorimetry problems.

Revised Taxonomy Level 3.2 C_A Apply (use) procedural knowledge

Students did not address this concept in physical science

It is essential for all students to

- Understand that the specific heat capacity (c) of a substance is the amount of heat required to change the temperature of one gram of a substance one degree Celsius.
  - $Q = mc\Delta T$ where
    - Q = heat (in joules)
    - m = mass (in grams)
    - c = specific heat capacity (in joules/gram Celsius degree)
    - ΔT = the change in temperature (Celsius degrees)
- Understand that the heat of fusion (L_f) of a substance is the amount of heat needed to melt a unit mass of a substance at its melting point
  - $Q = m L_f$ where
    - Q = heat (in joules)
    - m = mass (in grams)
    - L_f = the heat of fusion
- Understand that the heat of vaporization (L_v) of a substance is the amount of heat needed to vaporize a unit mass of a substance at its boiling point
  - $Q = m L_v$ where
    - Q = heat (in joules)
    - m = mass (in grams)
    - L_v = the heat of vaporization
- Solve problems involving heat lost or gained resulting in both temperature changes and phase changes

Assessment

The revised taxonomy verb for this indicator is implement (apply), the major focus of assessment will be for students to show that they can "apply a procedure to an unfamiliar task". The knowledge dimension of the indicator, procedural knowledge means "knowledge of subject-specific techniques and methods" In this case the procedure for solving problems involving heat lost or gained resulting in both temperature changes and phase changes